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*Completeness of enumeration of infants*  
*related to: Residence*  
*Race, Birth Month*  
*Age and Education of Mother*  
*Occupation of Father*

*Prepared under the supervision of*  
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Infant  
Enumeration  
Study  
1950

*Procedural Studies of the 1950 Censuses*  
No. 1



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### SUGGESTED IDENTIFICATION

U. S. Bureau of the Census. *Infant Enumeration Study : 1950.*  
U. S. Government Printing Office, Washington, D. C., 1953.

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.,  
or any of the Field Offices of the Department of Commerce - - - - - Price 40 cents

## PREFACE

This report presents statistics on the extent to which infants born in the first three months of 1950 were enumerated in the Seventeenth Decennial Census of the population of the United States, conducted as of April 1, 1950, and on reasons for the missing of infants, by characteristics of the infant and its parents. This study was undertaken with the cooperation of the National Office of Vital Statistics, Public Health Service, Federal Security Agency, and of the State registrars of vital statistics.

Provision for the Seventeenth Decennial Census was made in the act providing for the Fifteenth and subsequent decennial censuses, approved June 18, 1929, as amended. In addition to the basic publications and special reports of the 1950 Censuses of Population, Housing, and Agriculture, there will be a number of procedural studies which make available special information on how these censuses were taken, and on the quality of the results. These studies, of which this report is one, are being issued separately as a numbered series, "Procedural Studies of the 1950 Censuses."

The data in this report are based on tabulations of data from birth records, census records, and returns from a special mail inquiry. Most of the materials are from a complete count, but some are based on samples.

The materials presented here were prepared under the supervision of Howard G. Brunsman, Chief, Population and Housing Division, and Dr. Henry S. Shryock, Jr., Assistant Chief for Population Statistics, with the assistance of Edwin D. Goldfield, Program Coordinator. They were prepared by Wilson H. Grabill, Chief, Fertility Statistics Unit, and Calvin L. Beale, under the general direction of Dr. Paul C. Glick, Chief, Social Statistics Section. The compilation of the statistics was under the direction of Robert B. Voight, Assistant Chief for Operations, assisted by Lawrence A. Marzetti and Morton A. Meyer. Sampling procedures were under the direction of Joseph Steinberg, Chief, Statistical Sampling Section, assisted by Joseph Waksberg. The technical editorial work and planning were under the supervision of Mildred M. Russell, assisted by Dorothy M. Belzer.

The collection of Infant Cards was under the supervision of Lowell T. Galt, then Chief, Field Division. The collection of birth records and the matching of Infant Cards and birth records were performed by the National Office of Vital Statistics of the Public Health Service, Federal Security Agency, Dr. Halbert L. Dunn, Chief, under the supervision of Sam Shapiro, Chief, Natality Analysis Branch, and Joseph Schachter. The mechanical matching operation and tabulations of matched records were under the supervision of Howard West, Chief, Statistical Processing Branch, and Sidney Binder, Assistant Chief. The identification of enumeration districts for the searching of 1950 Census population schedules was under the supervision of Clarence E. Batschelet, Chief, Geography Division, Bureau of the Census; and tabulations of unmatched birth records were made by the Bureau of the Census under the supervision of C. F. Van Aken, Chief, Machine Tabulation Division.

April 1953.

## *U. S. Census of Population, 1950*

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- II Characteristics of the Population (comprising Series P-A, P-B, and P-C bulletins)
- III Census Tract Statistics (comprising Series P-D bulletins)
- IV Special Reports (comprising Series P-E bulletins):
  - Employment Characteristics, Marital Status, Institutional Population, Nativity and Parentage, Nonwhite Population by Race, Persons of Spanish Surname, Puerto Ricans in Continental United States, State of Birth, Characteristics by Size of Place, Education, etc.

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    - 10 Farms and Farm Characteristics by Economic Subregions

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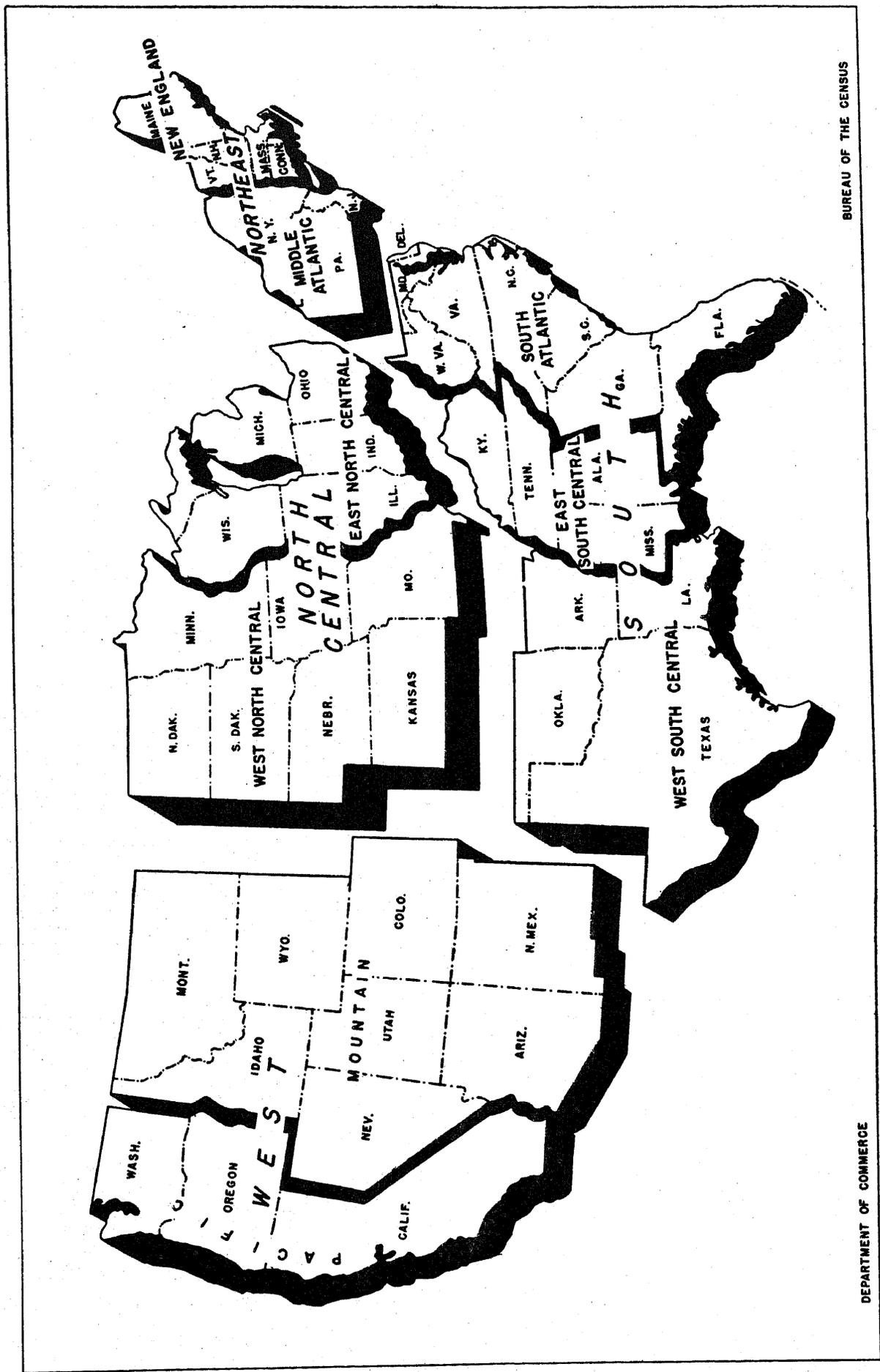
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Figure 1.—REGIONS AND GEOGRAPHIC DIVISIONS OF THE UNITED STATES



BUREAU OF THE CENSUS

DEPARTMENT OF COMMERCE

# Infant Enumeration Study: 1950

## GENERAL

This report presents data primarily on the completeness of enumeration in the 1950 Census of infants born in the first three months of 1950, and on reasons for missing infants. To add perspective, some information is given on the completeness of the census count for children of various ages, although a full discussion of the census count is beyond the scope of the present report. Completeness of enumeration, as the term is used here, pertains to the extent to which persons have been listed in the census, and disregards other forms of error. The census count of children in an age group, on the other hand, is affected not only by the missing of children in the census but also by misstatements of age and by the counting of the same infant at two different addresses. Errors in reporting of age may sometimes account for much of the net error in the census count.

The data on enumeration are based on a check of birth records against census records and on an inquiry mailed to parents of infants for a sample of these birth records for which no matching census record could at first be found. The address of the infant at the time of the census was obtained through the mail inquiry, and this provided the basis for making a more thorough check of census records than could be made on the basis of the address given on birth records. Possible reasons for the missing of infants in the census were also obtained through the mail inquiry. Excluded from the data on completeness of enumeration (except in table B) are infants who died before April 1, 1950, illegitimate infants insofar as identified from birth records, and infants born in a State which was not the usual residence of the mother.

The limited information given on the accuracy of the census count for children of various ages is based on comparisons of the census count with the number expected from statistics of births, deaths, and net migration. (See section on "Related materials.")

Statistics are presented on the completeness of enumeration of infants for States, urban and rural, by color, and for regions by race and month of birth of infant, age and education of mother, and the major occupation group of the father. Since part of the data are based on a sample, the results are subject to sampling variability as explained in the section on "Reliability of sample data." This section also contains a description of the sample, which varied from area to area.

The Infant Enumeration Study was undertaken to provide information that might lead to better enumeration of young children in future censuses and to provide

a basis for estimating the extent of error in 1950. Although it was necessary to restrict the study to infants born in the first three months of 1950, some of the patterns of differential completeness of enumeration by urban-rural residence, etc., may be applicable to older infants.

## SUMMARY OF FINDINGS

About 96.4 percent of infants born in the first three months of 1950 were enumerated in the 1950 Census, according to the check of birth records against census records. This figure includes 1.3 percent for whom birth records indicated that the infants were born in the period but who were enumerated as born before 1950. These figures are exclusive of infants whose birth records indicated that they were illegitimate or were born in a State other than the State of usual residence of the mother. It is estimated that, if there had been no such exclusions, the percentage enumerated would have been about 95.9 percent. (See section on "Coverage.")

These figures answer the question, "How accurate is the census enumeration of infants?" which is not the same as "How complete is the census count of infants?" The accuracy of the census count of infants born in the first three months of 1950, including illegitimate infants and infants born in a State which was not the usual residence of the mother, is estimated to be 95.1 percent. (See table A.)

Among the regions, the North Central Region had about the highest percentage of infants enumerated (97.8) and the South the lowest (94.7). Among the States, Ohio and Connecticut led with 98.3 percent and New Mexico was last with 91.0 percent. Thirty-four of the States had percentages of 95.0 or better. The completeness of enumeration was about the same for the urban and rural-nonfarm population (96.8 percent and 96.7 percent, respectively) but was lower for the rural-farm population (94.7 percent). White infants were more completely enumerated than non-white, the figures being 97.1 percent and 91.4 percent, respectively. There was no evidence of any real difference in the enumeration of boys and girls.

By month of birth, there was a very slight tendency for less complete enumeration of the oldest infants studied--those born in January--than of those born in February and March. By order of birth, the pattern was one of less complete enumeration at the extreme orders, with first births and tenth- or higher-order births having been less completely enumerated than the intermediate birth orders. These comparisons may reflect unsettled living arrangements among

some recent parents of a first child and among some very large families.

By age of mother, infants of mothers under 25 years old tended to be less completely enumerated than infants of older mothers. By education of mother, infants of mothers who had completed less than 7 years of grade school were more likely to be missed than were infants of mothers with more education. Infants with fathers who were in the armed forces were relatively more often missed than were infants with civilian fathers.

In about 82 percent of the 16,045 cases in which infants were classified as definitely or probably missed in the census, the parents were also missed.<sup>1</sup> This 82 percent was distributed as follows: (a) About 20 percent of the families of missed infants were absent from home or moved during the enumeration period; (b) about 55 percent of the missed infants were not counted because the enumerators overlooked some obscure dwellings, failed to enumerate all dwelling units in a structure, or listed some occupied dwelling units as "vacant"; (c) still another 8 percent resulted from failure of relatives or nonrelatives to report the parents and the infant who were staying with them, probably because the enumerator did not ask specifically about people who were living temporarily in the dwelling unit.

In the 18 percent of cases where the parents were enumerated but the infant was missed, the reasons given for the oversight included: (a) A neighbor gave incomplete information; (b) the family did not think infants were to be reported; and (c) infant died between April 1 and the time of the census enumeration. In only about 5 percent of the cases did the family forget to report the infant or think infants were not to be reported.

The proportion of cases in which the entire family was also missed if the child was missed was high in each of the several categories into which the relatively small number (16,045) of missed infants was subdivided. The infants were classified by urban and rural residence, by region of residence, by color, by age of mother, by educational attainment of mother, or by major occupation group of father. In rural areas and among whites, the tendency for the entire family to be missed if the infant was missed was especially pronounced. For rural areas, the greater difficulty of finding some dwelling units may have tended to increase somewhat the relative proportion of cases in which the family was missed. Probably nonwhite households failed more often than white households to report infants.

<sup>1</sup> The figure, 82 percent, may seem surprisingly large. It is possible that its size may be due in part to errors arising from procedural problems inherent in the searching operation, such as discrepancies with respect to the spelling of names, etc., between birth records and census records, but it seems unlikely that these problems could have introduced very many failures to match. In urban areas, where more precise addresses were given, it was possible to narrow the search of census records and hence to establish with greater confidence whether or not the parents of the infant were missed. Despite this fact, the proportion of cases in which neither the infant nor the parents was found was also high in urban areas (79 percent).

## RELATED MATERIALS

There is interest in the completeness of enumeration and in the accuracy of the census count for persons of every age. Some of the materials available are severely limited in scope (such as the restriction of the Infant Enumeration Study to infants born in the first three months of 1950); furthermore, some are subject to sizable sampling variability (as in the case of the Post-Enumeration Survey); all are subject to possible biases; and some measure net error in the census count without indicating how it arises (as illustrated by comparisons of the census count with the number expected from births, deaths, and net migration). The various types of limited data, of which the Infant Study is one, can be considered together for an approximate evaluation of the problem. An exhaustive analysis of this kind is beyond the scope of the present report. For the benefit of those readers who may wish to explore the field, several sources of related materials are described below:

Reports of earlier censuses.--From time to time the Bureau of the Census has prepared reports which contained materials on the completeness of the count of young children. These were based on such evidence as the following: (a) The population enumerated as under 5 years old in one census was less than the number enumerated as 10 to 14 years old in a census taken 10 years later, with allowance for deaths and migration in the interval; (b) the population enumerated as under one year old and as one year old was sometimes less than the number enumerated at ages 2, 3, and 4 years, despite little change or an increase in the annual number of births; (c) there seemed to be a tendency to report infants almost a year old as one year old since few were reported as 10 and 11 months of age in some censuses; and (d) the child population enumerated was less than the number expected from births, deaths, and net migration. An example of materials in reports of earlier Federal censuses on the subject appears in Special Reports of the Census Office, Twelfth Census: 1900, Supplemental Analysis, pp. 139-143.

From 1870 to 1900 some of the census officials thought net overstatements of age might be the major factor in the apparent undercount of infants, whereas later writers were inclined to ascribe the undercount mainly to underenumeration. Estimates of the completeness of the count of children under 5 years old by States in 1940, based on comparisons of census data with vital statistics, appear in U. S. Bureau of the Census, U. S. Census of Population: 1940, Differential Fertility, 1940 and 1910--Standardized Fertility Rates and Reproduction Rates, Appendix A, pp. 32 and 33. This source also gives estimates for 1910, computed by a different method.

Independent estimates of the completeness of the census count.--Table A presents estimates of the completeness of the census count for children of various ages. This table compares the count with the number expected from statistics of births, deaths, and net migration.

In the data for the expected population in table A, allowance has been made for underregistration of births and of deaths for children in the first year of life. This adjustment and the statistics on births, deaths, and net migration are subject to some error;

so also is the estimate of the census count for infants born in the first three months of 1950, which was based on Infant Cards and on an allowance for the small proportion of infants enumerated in the census but with no Infant Card filled out.<sup>2</sup> The expected population is computed as of April 1, whereas the ages of children enumerated in the census are as of the time of enumeration; about half of them were enumerated between April 1 and April 13, the others later. The implicit assumption is that these errors are negligible; therefore, the difference between the census count and the expected population is assumed to represent the net effect of errors in the census count, such as missing children, enumerating some more than once (at different addresses), and misreporting of age.

The data in table A include illegitimate children and children born in a State which was not the usual residence of the mother, unlike most other tables in this report.

The census count of infants under one year old is only 89 percent of the expected number, whereas for infants born in the first three months it is about 95 percent. Taken at face value, these estimates indicate that a considerably smaller proportion of infants born in the first three months of 1950 than of those born in the last nine months of 1949 were not counted at the correct age or were missed in the census. Information from other sources, however, suggests that the main reason for the difference may be the misreporting of age.

A question sometimes asked is whether the special fees paid for filling Infant Cards in the Censuses of 1950 and 1940 might not have caused some enumerators to make an extra effort to enumerate very young infants and to understate age of infants who were a little older than required for the Infant Card. In 1940 when Infant Cards were filled out for infants under 4 months old, the count of infants at the adjacent age of 4 months was particularly deficient as compared with expectations from statistics of births, deaths, and net migration. On the other hand, the completeness of the census count at ages under 4 months was no better than that at ages between 5 and 9 months. (Of course, it might have been worse without an Infant Card.) Also, it appears that the count of children under 1 year old may have been less complete in 1940, when there were Infant Cards, than in 1930, when there were no Infant Cards. Hence, it is doubtful whether the Infant Cards improved the completeness of the census count either of infants in general or of very young infants in particular.

For more information on errors in the reporting of infants born in the first three months of 1950, see section on "Errors in reporting," and table 14.

Post-Enumeration Survey.--A "post-enumeration survey" made by the Bureau of the Census in connection with the 1950 Census obtained information on the completeness of enumeration of persons of every age, including young children, and also on mis-

reporting of age. Some of the results have been published in U. S. Bureau of the Census, U. S. Census of Population: 1950, Vol. II, Characteristics of the Population, Chapter C, U. S. Summary, and a more detailed analysis will be published in a forthcoming special report. This survey was based on a coverage check in about 3,500 widely distributed small areas, such as city blocks or parts of rural townships, to see if all dwelling units in these areas had been enumerated in the 1950 Census, and on an intensive interview of about 22,000 households in these areas to check on the accuracy of the information originally collected. The interviewers in the Post-Enumeration Survey, however, experienced much the same difficulties as the original census enumerators in locating certain persons, such as those with no fixed place of residence, and in determining whether they should be counted in the area.

The Post-Enumeration Survey did not include figures on infants born in the first three months of 1950 as a separate group; hence, no direct comparison can be made with data from the Infant Enumeration Study. However, data for children under 5 years old were obtained from the Post-Enumeration Survey. The correct count of children under 5 years old in 1950 according to the Post-Enumeration Survey was about 16,551,000 as compared with the 1950 Census count of 16,164,000. The difference is 387,000, or 2.3 percent, and represents the net effect of the following types of errors: the exclusion of 298,000 children who were either enumerated in the wrong enumeration district or were missed in the 1950 Census; the inclusion of 170,000 children who were not residents of the enumeration district or were counted more than once; the exclusion of 472,000 children who were under 5 years old according to the survey but were reported in the census as 5 years old or over; and the inclusion of 213,000 children reported as under 5 years old in the census, but who were 5 years old or over according to the survey. Since the Post-Enumeration Survey is based on a sample, these figures are subject to sampling variability. The chances are 19 in 20 that the net difference of 387,000 cited above would have been somewhere between 193,000 and 580,000 if the Post-Enumeration Survey had been made on a complete basis rather than a sample basis. Any uncontrolled biases, such as the possible incomplete coverage check, could have an additional effect. Despite the large sampling variability and the possibly uncontrolled biases, the Post-Enumeration Survey indicates that misreporting of age plays an important role in causing errors in the census count of young children.<sup>3</sup>

The net underenumeration of the population of all ages in the 1950 Census was 1.4 percent according

<sup>3</sup> A similar conclusion may be drawn from the Canadian Census of 1941, in which census checks of several thousand census records against birth records indicated that only about 1 percent of infants under 1 year old were not enumerated in the census, whereas there was a net loss of 6.5 percent from misreporting of age, on the assumption that the date of birth on the birth record was correct. Canada, Dominion Bureau of Statistics, Eighth Census of Canada, 1941, the Changing Size of the Family in Canada, Census Monograph No. 1, by Enid Charles, pp. 263-265, Edmond Cloutier, Ottawa, 1948.

<sup>2</sup> Enumerators were instructed to fill an Infant Card for each infant enumerated as born in the first 3 months of 1950. See appendix.

to the Post-Enumeration Survey, as compared with 0.8 percent for children under 5 years old. Evidence from other surveys confirms the fact that the problem of underenumeration is not limited to young children. In the past many demographers thought that the problem was most severe among them, but it now seems best to reserve judgment on this point. The Post-Enumeration Survey does not give a definitive answer in this case.

#### AVAILABILITY OF UNPUBLISHED DATA

Because of the small number of nonwhite persons in the urban or rural parts of some States, color is not shown throughout in table 1. The data were tabulated uniformly by color, however. The material shown for the North and West in tables 3 to 8 is available

separately for the Northeast, North Central, and West Regions, by urban and rural residence, by color. For tables 2 to 8, categories of enumeration status based on birth records not matched by the National Office of Vital Statistics are available for cases with a mail inquiry response and those with no mail inquiry response; and, for those with a mail inquiry response, data are available for parents who did claim, and for those who did not claim, that an enumerator called on the family or that a neighbor gave information for the family. The material in tables 10 to 13 was tabulated by color. The tabulated, but unpublished, statistics can be made available upon request, for the cost of transcription, consolidation, and any computation required. Requests for such unpublished statistics should be addressed to the Director, Bureau of the Census, Washington 25, D. C.

## DEFINITIONS AND EXPLANATIONS

### COVERAGE

As stated above, the study of completeness of enumeration (the primary objective of the Infant Enumeration Study) was limited to infants with birth records indicating that they were born in the first three months of 1950. It excluded infants who died before April 1, 1950, illegitimate infants insofar as identifiable from birth records, and infants born in a State which was not the usual residence of the mother. Some other exclusions may also be noted, although they were relatively minor. The birth records used were, in general, limited to those in the National Office of Vital Statistics at the time the census sample of unmatched birth records was drawn. The relatively few records still in State offices were excluded except for some records which were matched after the selection of the census sample; as indicated in the section on enumeration status below, the number of such cases was usually too small to affect the estimated percentage of infants enumerated. Also excluded were birth records for children who were living abroad at the time of the census, who were residents of a foreign embassy and not subject to enumeration, or who, despite the date on the birth record, were not actually born in the first three months of 1950.

Illegitimate infants and infants born in a State which was not the usual residence of the mother constituted a sufficiently large proportion of the records in some areas to affect the estimated percentage of infants enumerated. Relatively more of the excluded than of the included infants were missed in the census enumeration. For the convenience of those readers who may wish to allow for this effect, a special table (table B) prepared by the National Office of Vital Statistics is presented below.

In using table B, the reader should bear in mind that a substantial proportion of the unmatched birth records undoubtedly represent infants who were actually enumerated on the population schedule but the birth record was not matched because no Infant Card was filled or because a change in name or in other information between birth and enumeration prevented identification. Possibly at least half of the unmatched birth records for illegitimate infants and infants born in a State which was not the usual residence of the mother are for infants actually enumerated in the census.<sup>4</sup> This assertion is based on the Bureau's experience with the follow-up of originally unmatched birth records for legitimate infants born in a State which was the usual residence of the mother and on the

assumption that many illegitimate children were enumerated under a different name from that given on the birth records. If illegitimate infants and infants born in a State which was not the usual residence of the mother were included, and if half of the unmatched records for these infants were assumed to represent infants actually enumerated, then the estimated percentage of infants enumerated in the 1950 Census would drop from 96.4 percent to 95.9 percent.

Infants without birth records are not represented in the Infant Enumeration Study, except in table A. Their exclusion affects the accuracy of the estimated percentage of infants enumerated in the census only if a different proportion of these infants without birth records were enumerated than of infants with birth records and if they formed a sufficiently large proportion of all infants. (There is reason to believe that infants without birth records were more frequently missed in the census than were infants with birth records.) Some idea of the minor nature of the problem can be obtained from a study made for the counterpart problem in the Birth Registration Test of 1940. This study indicated that infants without census records have very minor effect on birth-registration completeness figures above 90 percent.<sup>5</sup> This conclusion should apply at least as well to the Infant Enumeration Study, since there were relatively fewer infants in 1950 without birth records than infants in 1940 without census records.

### RELATION TO BIRTH REGISTRATION TEST

The Infant Enumeration Study was made in conjunction with the Birth Registration Test of the National Office of Vital Statistics.<sup>6</sup> Preliminary results of the Birth Registration Test have been published in several

<sup>4</sup> Even if so large a proportion of the illegitimate infants with unmatched birth records were enumerated, the proportion of illegitimate infants missed in the census would still be larger than the proportion of legitimate infants missed, because relatively more of the birth records of illegitimate children were unmatched.

<sup>5</sup> Sam Shapiro, "Estimating Birth Registration Completeness," *Journal of the American Statistical Association*, Vol. 45, No. 250, June 1950, pp. 261-264.

<sup>6</sup> A Birth Registration Test was also made in 1940, but plans for an Infant Enumeration Study in 1940 were not carried out because of the pressure of other work following the outbreak of World War II.

reports.<sup>7</sup> More detailed findings and methodological statements will appear in future publications of the National Office of Vital Statistics, Public Health Service, Federal Security Agency. Both studies cited were for infants born in the first three months of 1950. Special Infant Cards (Form P-3) filled by enumerators in the 1950 Census were matched against birth records from the States; matched records represented infants who were both enumerated in the Federal census and registered on a State birth certificate. The National Office of Vital Statistics did most of the matching work, using personnel sworn in as special agents of the Bureau of the Census. The two agencies shared the costs of this operation.

The National Office of Vital Statistics used all unmatched Infant Cards to check on underregistration of births whereas the Bureau of the Census used a sample of unmatched birth records to check on under-enumeration of infants. The National Office of Vital Statistics needed information on birth registration for small areas and therefore could not use a sample.

Another difference arose from the exclusion from the census study of infants whose birth records indicated that they were illegitimate or that they were born in a State which was not the usual residence of the mother. These cases were kept in the Birth Registration Test. The Infant Cards used by the National Office of Vital Statistics did not indicate whether the infant was illegitimate or not, whereas the birth records which were used by the Bureau of the Census usually did. The agencies agreed not to write to parents of illegitimate children. Births occurring in a State which was not the usual residence of the mother were excluded from the census study because a stratified sample of unmatched birth records in a particular State had to be selected soon after the birth records for that State were processed, so that as many parents as possible could be reached in the mail inquiry before they changed their place of residence or forgot any visit by an enumerator. Since illegitimate births and births in a State which was not the usual residence of the mother were excluded from the census sample of unmatched birth records, they had to be excluded from matched records also to avoid an overstatement of the completeness of infant enumeration.

#### ENUMERATION STATUS

Probably most users of tables 1 to 8 will be chiefly interested in the "Adjusted estimate of percent enumerated" shown for each population group. This estimate, as explained at the end of this section, combines appropriate proportions of five categories of enumeration status and represents the overall percentage of infants enumerated in the 1950 Census. The five separate categories are indicative of the quality of the original data, however, and will be explained first.

<sup>7</sup> Sam Shapiro and Joseph Schachter, "Birth Registration Completeness, 1950," Public Health Reports, Vol. 67, No. 6, June 1952, pp. 513-524. Sam Shapiro and Joseph Schachter, "Methodology and Summary Results of the 1950 Birth Registration Test in the United States," Estadística, Vol. 10, No. 37, December 1952, pp. 688-699.

The five categories of enumeration status used are:

- Definitely enumerated
- Probably enumerated
- Probably missed
- Definitely missed
- Enumeration status uncertain

Every infant was either enumerated or missed in the census, but the true status of some infants was not known, because the population schedules could not be conclusively searched. The infant's address during the 1950 Census enumeration was needed to locate the population schedules on which he might be enumerated. Sometimes the address was unknown and, of course, the schedules for 150 million people could not be examined. Sometimes the address was so vague that a search could not be limited to a few enumeration districts, or to the population schedules for a few thousand people. In other cases the parents' reply to the mail inquiry gave information which indicated so definitely that the child was or was not enumerated that the outcome of a search of the population schedules was almost a foregone conclusion. The search was therefore eliminated and the limited means available were utilized to investigate other, less certain cases.

The five categories of enumeration status describe the degree of success in searching the 1950 Census records and of the information received from the mail inquiry.<sup>8</sup>

Definitely enumerated.--The category "Definitely enumerated" comprises cases where a census record was found to match a birth record. To distinguish between data from a complete count and data from a sample, it is subdivided into (a) birth records matched with the 1950 Census Infant Cards and (b) infants found in searches of the population schedules. The matches with Infant Cards are the only part of the five categories that has data from a complete count.

Group a includes about 8,000 matches which are valid for the Birth Registration Test but which, in theory, should not have been included in the Infant Enumeration Study. These involved birth records not sent in from the States in time for early matching efforts but found later when a determined search was made in State offices to locate birth records to match remaining Infant Cards. Since only matched birth records were added in this late stage, their inclusion tends to overstate the completeness of enumeration of infants. Practically, the bias from this source was usually negligible, and it was much easier to tabulate all existing punch cards for group a than to locate and remove the bias-introducing late matches. Most States had relatively few late matches and their inclusion does not affect the adjusted estimate of the percent enumerated. The State most affected is Arkansas, and, for this State,

<sup>8</sup> Since some degree of judgment entered into the classification of marginal cases, it is appropriate to acknowledge that the terms "definitely enumerated" and "definitely missed" are somewhat arbitrary. Marginal cases were relatively infrequent, however. Members of the professional staff who worked with the searching operation believe that only 1 to 5 percent of all classifications were marginal.

the exclusion of the bias-introducing late matches would reduce the adjusted estimate of percent enumerated from 94.2 to 93.7.

Group b included matches against entries on the regular population schedules of a sample of birth records remaining after group a had been matched. It represented infants definitely enumerated in the census for whom no Infant Card was filled.

Definite rules for the establishment of a match were used in both groups a and b. In general, agreement was required on such things as the names of the infant and its parents, ages, race, and other criteria, including, for group b, the address. When most items agreed, occasional minor variations were permitted, such as the spelling of a name as LODD for LADD or SMITH for SMYTHE or by the use of diminutives like Betty for Elizabeth.

Probably enumerated.--The category "Probably enumerated" comprises cases where the respondent to the mail inquiry claimed that the infant had been reported to the enumerator. Because of budgetary limitations, no search of the population schedules was made to confirm the claim, except in the State of Delaware.<sup>9</sup> The Delaware search provided some basis for an estimate of the proportion of infants actually enumerated; this estimate was needed to compute the adjusted percent of infants enumerated.

Supporting an assumption that a substantial percentage of such infants actually were enumerated is the fact that all reports that the child had been enumerated were unsolicited; that is, the letter did not ask whether the child had been enumerated. The form letter sent out indicated that no census record for the infant had been found and asked for possible reasons for the missing of the infant in the census. Some of the respondents not only said that the child was reported but gave detail which could come only from a vivid recollection. For example, some mentioned that the enumerator listed the child on two different forms (the basic population schedule and the Infant Card), or that the enumerator said he was out of special forms for infants. A direct question, such as "Was your child reported to the enumerator?", might have brought in more reports of enumeration.

On the other hand, incorrect reports of the infant's having been enumerated may have occurred from faulty memory, from confusion of the Federal census with a local school census or some other survey, from a defensive reaction by people who might have thought they were being blamed for a mistake, and from other reasons. It is felt, however, that the negative aspects were relatively unimportant. The importance of defensive reactions may be discounted since not over 50 of the approximately 23,000 letters returned contained any specific indication of fear or resentment. On balance, it appears that a high proportion--perhaps nine-tenths--of the infants classified as "Probably enumerated" were actually enumerated.

<sup>9</sup> In Delaware the claim was substantiated in 51 of 57 cases having an adequate address. The proportion of correct claims may have varied from this in other States.

Probably missed.--The category "Probably missed" arose partly from a curtailment of searching operations to meet limitations of time and cost and partly from want of sufficient detail for the address at the time of the birth. It comprises (a) infants for whom respondents to the mail inquiry indicated that the child had died between April 1 and May 31 and (b) infants for whom the population schedules were conclusively searched for the address of the parents as of May 1 (from the mail inquiry) but not for a different address at the time the infant was born (from the birth record), without finding the infant or its parents. An estimate of the proportion of infants in this category who were actually missed can be made on the basis of the proportion missed in similar cases in other categories where a conclusive search of the population schedules was made. Several hundred of these conclusive searches, widely distributed among the States, were made for the "Definitely enumerated" and "Definitely missed" categories. Among cases where the child died between April 1 and May 31, 93 percent were not enumerated in the census. Among cases where the address of the parents on May 1 was different from that at the time the child was born, 96 percent were not enumerated in the census. The infant was enumerated in the remaining 7 percent and 4 percent of the cases, respectively. Since the scanty information available suggested that between 90 and 95 percent of the cases in question were actually missed, it seemed reasonable to assume that at least nine-tenths of infants in the category "Probably missed" were actually missed.

Definitely missed.--The category "Definitely missed" comprises infants not found after a conclusive search of the population schedules. This involved a search for the address on May 1 and also for the address of usual residence of the mother at the time of birth of her child, if it was different. Of course, one address sufficed when the parents were found at the first address searched and the response to the mail inquiry indicated that the child was with the parents throughout April and May. The search for an address was considered to be conclusive when it met one of the following criteria:

Street and specific house number found in the population schedules.

Proper block or street found but not the house number.

Block or street not enumerated.

Sufficient number of enumeration districts searched to cover all reasonable territory around an indefinite rural address like "North side of Highway 57, 5 miles west of Hopeville," allowing for some error in the distance and for a place well off the road.

Other evidence, such as the finding on the population schedule of persons named in the mail inquiry for the identification of the location (such as John Smith farm, 1 mile east of Hopeville, Va.).

Enumeration status uncertain.--The category "Enumeration status uncertain" is a residual classification for infants not established as definitely enumerated, probably enumerated, probably missed, or definitely missed. Infants in this category have in common the fact that the address at the time of the census was either unknown or was reported in

insufficient detail to permit a conclusive search of the population schedules, and there was no claim that the infant had been enumerated or had died. On a national basis, 72.5 percent of the category "Enumeration status uncertain" consists of infants for whom there was no response to the mail inquiry, usually because the post office was unable to locate the family at the address given on the birth record. (The letters were usually returned with notations such as "moved and left no address" or "unknown.")

Special tabulations were made to approximate the proportion of infants actually enumerated for the group classified as "Enumeration status uncertain." In cases with a mail inquiry response, account was taken of whether or not the family claimed that an enumerator had called or a neighbor had given information. Similar information was available for other categories where the address detail was good and the population schedules were searched. It was then assumed that infants with enumeration status uncertain were enumerated at a rate nine-tenths of that for similar cases in other categories.

In cases with no mail inquiry response, a minimum percentage enumerated was obtained from such searches as had been made of population schedules at the birth address. (A third of all nonresponse cases were so searched, and such infants as were found to be enumerated were reclassified as definitely enumerated. When an infant was not found, it might nonetheless have been enumerated elsewhere or have died or left the country. The minimum percentage was applied to the two-thirds of nonresponse cases not searched.) Also, a maximum percentage enumerated was obtained as the percentage definitely or probably enumerated among all response cases. It was assumed that the true percentage for nonresponse cases fell two-thirds of the way from the minimum percentage to the maximum percentage.

The work was performed separately for the four regions, urban and rural, by color. It resulted in estimates of the proportion actually enumerated among all infants classified as "enumeration status uncertain" which ranged from .270 for nonwhites in rural-nonfarm areas of the South to .419 for whites in rural-farm areas of the North Central States.<sup>10</sup> No corresponding proportions were available by States. It was assumed that the proportion for a region could be applied to the corresponding residence-color part of each State and that State totals could be obtained by adding the weighted products for the component residence-color parts of the State.

Adjusted estimate of percent enumerated.-- Tables 1 to 8 also show the "Adjusted estimate of percent enumerated," which answers the question "How complete is the census enumeration of infants?" This estimate was computed by taking as enumerated all cases definitely enumerated, nine-tenths of cases probably enumerated, one-tenth of cases probably missed, and a proportion of cases with enumeration status uncertain derived as explained in the preceding paragraph. The resulting estimate of total infants enumerated was then expressed as a percentage of the total birth records.

The error which may result from the arbitrary proportions applied to the indefinite categories can readily be determined by modifying these proportions for high and low estimates and is then found to be

relatively small. A very high estimate might treat as enumerated all infants definitely enumerated, all infants probably enumerated, two-tenths of infants probably missed, and half of infants with enumeration status uncertain. These assumptions would result in a high estimate of 97.0 percent enumerated for infants in the Nation as a whole, as compared with the official estimate of 96.4 percent. A very low estimate might treat as enumerated all infants definitely enumerated, eight-tenths of infants probably enumerated, none of the infants probably missed, and two-tenths of infants with enumeration status uncertain. This would result in a low estimate of 96.0 percent enumerated for infants on a national basis. These assumptions are thought to be rather extreme. For small areas, such as parts of States, the range of error may be greater or smaller, depending on the distribution of the various categories and on the number of cases involved.

REASONS FOR MISSING INFANTS

In the mail inquiry, parents were asked to give possible reasons why their child was missed in the census. Some reasons were listed for their guidance, and they were asked to check all that might apply and to give any additional possibilities that might occur to them. The questionnaire was accompanied by a letter indicating that no census record had been found for the infant and asking for cooperation in determining why infants are sometimes missed in censuses.

<sup>10</sup> The estimated proportion actually enumerated among infants with enumeration status uncertain is as follows, where a value of 1.000 would represent enumeration of all infants:

	White	Nonwhite
United States.....	.352	.294
Urban.....	.371	.305
Rural nonfarm.....	.321	.275
Rural farm.....	.342	.287
Northeast.....	.403	.337
Urban.....	.416	.336
Rural nonfarm.....	.385	.348
Rural farm.....	.351	.313
North Central.....	.389	.322
Urban.....	.396	.320
Rural nonfarm.....	.345	.312
Rural farm.....	.419	.369
South.....	.335	.283
Urban.....	.362	.286
Rural nonfarm.....	.299	.270
Rural farm.....	.325	.286
West.....	.294	.307
Urban.....	.297	.330
Rural nonfarm.....	.275	.248
Rural farm.....	.312	.275

The following values were used when regions were combined for some tables:

North and West.....	.357
White.....	.366
Nonwhite.....	.322
Urban.....	.363
Rural nonfarm.....	.334
Rural farm.....	.363

## INFANT ENUMERATION STUDY

Naturally, the parents were not always aware of the real reason for missing the infant, and the possible reasons given were sometimes a matter of speculation. The tabulations were limited to infants established as definitely or probably missed. These were subdivided according to whether the parents were found to be enumerated on a search of the population schedules. However, for infants classified as probably missed (for whom the population schedules were not conclusively searched), the following assumptions were made on the enumeration status of the parents: where the infant died in the enumeration period, the parents were classified as probably enumerated; where the infant and its parents were not enumerated at the address claimed at the time of the census and no search was made for the (different) address at the time of birth, the parents were assumed to have been missed. These assumptions were made on the basis of the findings on other cases where conclusive searches were made; they should have been correct for most cases.

Some parents gave more than one reason for the missing of infants or gave an inapplicable reason; hence, a system of priorities was established for the selection of a reason to be ascribed. In this process, some inapplicable reasons were automatically eliminated and only one of two or more possible reasons was taken.

Reasons for missing infants whose parents were definitely or probably enumerated were selected in the following sequence:

1. Death of infant in April or May 1950.
2. Infant temporarily away from parents in enumeration period. (Infants permanently away, as in the case of adoption, were usually not traceable and hence were usually classified as enumeration status uncertain.)
3. Information supplied by a neighbor, or parents had no knowledge of any call by the enumerator. (Someone, presumably a neighbor, did report the parents since the parents were found on a search of the population schedules. This selection automatically eliminates reasons such as "away from home," "living in an obscure place," etc., that were offered by parents who knew of no enumeration. It also means that subsequent selections of reasons below are all for records where there was a report by the parents that the household was visited by an enumerator.)
4. Enumerator said infant was too young to be counted. (This was really a valid reason only if the infant was born after April 1, 1950.)
5. Family did not think infants were to be counted.
6. Family forgot infant. (This is the classic reason hypothesized in past censuses for missing infants.)
7. Other acceptable reasons. (These include cases of children born after the enumerator called, as happened in a few enumeration districts used for training enumerators before April 1.)

8. No acceptable reason offered. (Usually either the statement "don't know" or no reason was offered; rarely did this include irrelevant reasons.)

Reasons for missing infants whose parents were definitely or probably missed (at least as indicated by a search of the schedules for the address as of May 1) were selected in the following sequence:

1. Living with relatives, with a claim that an enumerator called or a neighbor gave information. [When there was a claim that an enumerator called or a neighbor gave information, usually no reasons were offered for missing the parents. Relationship of the infant to the head of the household was examined in such cases. Where the relationship was a category other than "child" (son or daughter of head of household), the presumption was that if an enumerator did call, the relatives failed to report the infant and its parents. Incidentally, relatives were often listed on the population schedule at the address given, but neither the parents nor the infant were listed.]
2. Living with unrelated persons, with a claim that an enumerator called or a neighbor gave information. (The names of the unrelated persons were usually not known. The specific address was generally found on a search of population schedules, and the people living there were apparently unrelated to the parents. But they may not have been the people who failed to report the parents or the infant.)
3. Away from home. (Some respondents may have checked this box rather than report a move during the enumeration period. Most were persons still living at the old address given on birth records, hence most had not moved.)
4. Moved in enumeration period. (The mention of a move was volunteered by the informant. This was not listed as a possible reason in letters sent out.)
5. Living in an obscure place. (Respondents were asked if they had been in a place which might have been overlooked by the enumerator, such as a rural home hidden by woods or in a hollow; quarters over a garage, behind a store, or in an office building; a trailer; an attic; or a basement. This reason was frequently given by parents who knew of no enumeration but actually were reported by a neighbor. It is therefore difficult to evaluate.)
6. Living in a structure containing two or more dwelling units. (Sometimes respondents lived "upstairs" in what looked like a 1-family house, or the enumerator may have missed an obscure apartment or room in a larger building.)
7. No reason given. (Usually respondents stated "don't know," "not called on," etc., or made no statement at all. Perhaps most represent cases where the enumerator failed to find someone at home and did not return, or otherwise skipped an obvious place. Searches indicated some rare cases where one side of a block was missed and more frequent cases of entries of "vacant" for the address. An entry of "vacant" would sometimes enable an enumerator who was not conscientious to avoid a callback. Most searches simply indicated that the address was somehow skipped.)

## ERRORS IN REPORTING

Errors in the census count of infants arise not only from missing them but also from misreporting age and from counting them twice (reporting them as members of two different households). In table 14, an effort is made to assess the relative importance of each type of error, for legitimate infants born in the first three months of 1950, in a State which was the usual residence of the mother. (See also the section on "Related materials," which provides some data on the accuracy of the census count for all infants born in the first three months of 1950 and for children of various ages.)

The information on errors came from various sources. Some duplicate enumerations were discovered during processing operations when two or more Infant Cards for the same infant were found.<sup>11</sup> Most of the errors in reporting age were found in two ways. If the census enumerator reported an infant as born in January, February, or March 1950 when it was not, the National Office of Vital Statistics usually found the error when it could not match the Infant Card; sometimes the National Office of Vital Statistics got the correct date from the parents, and sometimes it found a birth record for the child. If the enumerator reported an infant as not born in January, February, or March 1950 when it was, the Bureau of the Census usually found the error when it took information from the unmatched birth records and searched the population schedules. Since Infant Cards were not always filled by enumerators and since conclusive searches of population schedules were not always made, allowance had to be made for additional errors which would thus have been found.<sup>12</sup>

## URBAN AND RURAL RESIDENCE

The classification of residence as urban or rural is based on the definition used in the 1940 Census rather than on the definition developed for use

<sup>11</sup> Infant Cards for visitors in the household were not counted as duplicate enumerations for table 14. (In the census, schedules for visitors were checked to see if the visitors were also reported at home. If so, the duplication was eliminated.)

<sup>12</sup> Infants classified as "Probably enumerated," "Probably missed," and as "Enumeration status uncertain" were assumed to have been enumerated in accordance with the proportions cited in the section above on "Enumeration status." Enumerated infants in these categories were subdivided into those properly enumerated as born in the first three months of 1950 and those improperly enumerated as born at another time. This grouping was developed from proportions among infants whose names were located in a search of the population schedules. This process gave all the needed estimates for items 1, 2, and 3 of table 14.

For items 4 and 5, counts of rejected Infant Cards had to be augmented by estimates of additional rejections which would have occurred if an Infant Card had been filled for every infant improperly enumerated as born at a time other than January, February, or March 1950. To get this estimate, the ratio of infants properly enumerated but with no Infant Card filled to infants properly enumerated with Infant Cards filled was applied to infants improperly enumerated with Infant Cards filled.

in the 1950 Census. By the 1940 definition, the urban population comprises, in general, all cities and other incorporated places having 2,500 inhabitants or more. Places of this type constituted about 96 percent of the urban population in 1940. A second type is limited to the States of New Hampshire, Massachusetts, and Rhode Island, in which States it is not the practice to incorporate as municipalities places of less than 10,000. This type is made up of towns (townships) in which there is a village or other thickly settled area having more than 2,500 inhabitants and comprising either by itself or when combined with other villages in the same town more than 50 percent of the total population of the town. A third type of urban place is made up of townships and other political subdivisions (not incorporated as municipalities nor containing any areas so incorporated) with a total population of 10,000 or more and a population density of 1,000 or more per square mile. The remainder of the population is classified as rural and is subdivided into the rural-farm population, which comprises all rural residents living on farms, and the rural-non-farm population, which comprises the remaining population.

Preliminary population counts obtained in the 1950 Census or estimates for 1950 were used in the classification by the 1940 rules. The classification was made for the address at the time of the census, if known; otherwise it was made for the usual address of the mother at the time the infant was born. Where farm or nonfarm residence was not reported, as in the case of no reply to the mail inquiry, it was estimated from the address, occupation of the father, and distributions from other birth records with known residence for each State.

The classification of residence as urban or rural by the 1940 Census definition differs from the one developed for use in the 1950 Census. The latter includes as urban not only incorporated places of 2,500 or more but also unincorporated places of this size and also the thickly built-up territory (or "urban fringe") around cities of 50,000 or more; it also dispenses with places urban by special rule. The urban population of the United States in 1950 was 96,467,686 by the 1950 rules of classification and 88,927,464 by the 1940 rules. It was more feasible to use the 1940 Census rules of classification for the Infant Enumeration Study than to try to determine whether addresses given in letters from parents or from birth records were located within the arbitrary boundaries of unincorporated places or within the urban fringe of a large city.

## MONTH OF BIRTH

The classification in table 4 of infants by month of birth is based on the birth date as reported in birth records.

## ORDER OF LIVE BIRTH.

The classification in table 5 of infants by order (first, second, etc.) of live birth is based on entries in birth records in response to questions on how many other live births the mother previously had; one was added to give the order of the current birth.

## RACE AND COLOR

The classification of infants by race and color is based on birth records. The concept of race is derived from that which is commonly accepted by the general public. It does not, therefore, reflect clear-cut definitions of biological stock, and several categories obviously refer to nationalities.

The term "color" refers to the division of population into two groups, white and nonwhite. The group designated as "nonwhite" consists of Negroes, Indians, Japanese, Chinese, and other nonwhite races. Persons of Mexican birth or ancestry who were not definitely Indian or of other nonwhite race were classified as white.

In addition to full-blooded Negroes, the classification "Negro" includes persons of mixed white and Negro parentage and persons of mixed Indian and Negro parentage unless the Indian blood very definitely predominates or unless the individual is accepted in the community as an Indian.

The category "Other races" includes Japanese, Chinese, and other nonwhite races. (Indians are shown separately in the present report.)

## AGE OF MOTHER

The classification of infants by age of mother is based on birth records and represents the mother's age at the time the infant was born. There were no instructions on how to report age; some probably reported age at last birthday and some at nearest birthday.

## YEARS OF SCHOOL COMPLETED BY MOTHER

The data on years of school completed were derived from the combination of answers to two questions on the Infant Card: (a) "What is the highest grade of school that she has attended?" and (b) "Did she finish this grade?"; and from one question in letters sent to parents in the sample of birth records for which no matching Infant Card was found: "What was the highest grade of school that the mother completed?" In the present report, these data are shown for mothers of infants born in the first three months of 1950.

The following definitions were supplied only to enumerators, not to parents. The questions on educational attainment applied only to progress in "regular" schools. Such schools are public, private, or parochial schools, colleges, universities, or professional schools, either day or night, full-time or part-time--that is, those schools where enrollment may lead to an elementary or high school diploma, or to a college, university, or professional school degree. Schooling obtained through a correspondence course was counted only if the course was given by a regular school such as a university and the person received credit thereby in the regular school system.

The question on highest grade of school attended called for the highest grade attended, regardless of "skipped" or "repeated" grades, rather than the number of full school years which the person had spent in school.

The question on completion of highest grade was to be answered "Yes" if the person had completed the full grade. If a person was still attending school in that grade, had completed only a half grade, or had dropped out of or failed to pass the last grade attended, the required answer was "No." In this report, persons who failed to report on completion of the grade were assumed to have finished.

## MAJOR OCCUPATION GROUP OF FATHER

The classification is based on information from the 1950 Census when birth records were matched with Infant Cards and on birth records alone when these were unmatched. The two sources of information yield data which may be only roughly comparable because of differences between concepts used in the two types of records and differences between enumerators, on the one hand, and physicians and attendants, on the other hand, in entering occupation of the father. The decision to code occupation from 1950 Census records where possible and from birth records in remaining cases arose partly from budgetary limitations and partly from the need for data on occupation that would be suitable for both the Birth Registration Test and the Infant Enumeration Study.

In the 1950 Census of Population, information on occupation was obtained for persons in the experienced civilian labor force. For an employed person, the question "What kind of work was he doing?" referred to the job he had held in the "census week," or the week preceding the enumerator's visit. If the person was employed at two or more jobs, the job at which he worked the greatest number of hours during this census week was reported. For an experienced unemployed person, the question referred to the last job he had held.

For birth records, information on the usual occupation of the father was obtained by the person filling out the form (usually a doctor or a hospital attendant with no specialized training or instructions about how to report occupations). For many fathers the current job apparently was reported. Many fathers who were experienced unemployed persons reported the fact of their unemployment instead of their last occupation. Although students and members of the armed forces were so reported in some cases, in others they may have been reported according to former or anticipated civilian occupations or according to the type of work performed in military jobs. The factor of seasonality of certain types of work also enters into differences between occupation as reported in birth records and as reported in census records, inasmuch as the birth records were filed during the winter months and the census was taken in the spring. The birth records and census records, however, are thought to be sufficiently consistent to form the basis for rough generalizations about the relationship between completeness of enumeration and occupational group.

The Bureau of the Census coded occupation on both Infant Cards and birth records, by using the occupational classification system developed for the 1950 Census of Population. This system consists of 469 items, 270 of which are specific occupation categories; the remainder are subgroupings (mainly on the basis of industry) of 13 of the occupation categories. The 469 detailed items are classified

into 12 major occupation groups. In the present report, however, the major occupation groups "Farmers and farm managers" and "Farm laborers and foremen" have been combined into "Farm workers," and the major occupation groups "Service workers, except private household" and "Private household workers" have been combined into "Service workers, including private household."

The composition of the 1950 major groups (except the "not reported" group) is indicated in the illustrative list shown below:

Professional, technical, and kindred workers.--Includes Accountants; Actors; Airplane pilots and navigators; Architects; Artists; Athletes; Auditors; Authors; Chemists; Chiropractors; Clergymen; College presidents, professors, and instructors; Conservationists; Dancers; Dentists; Designers; Dietitians; Draftsmen; Editors; Embalmers; Entertainers; Farm management advisors; Foresters; Funeral directors; Healers; Home management advisors; Judges; Lawyers; Librarians; Musicians; Natural scientists; Nutritionists; Optometrists; Osteopaths; Personnel workers; Pharmacists; Photographers; Physicians; Professional nurses; Radio operators; Recreation workers; Religious workers; Reporters; Social scientists; Social workers; Sports instructors and officials; Student professional nurses; Surgeons; Surveyors; Teachers; Technical engineers; Therapists; Veterinarians.

Farmers and farm managers.--Includes tenant farmers and share croppers.

Managers, officials, and proprietors, except farm.--Includes Buyers; Building superintendents; Credit men; Lodge officials; Postmasters; Public administration officials; Purchasing agents; Railroad conductors; Ship officers, pilots, pursers, and engineers; Shippers of farm products; Union officials.

Clerical and kindred workers.--Includes Bank tellers; Bill and account collectors; Bookkeepers; Cashiers; Dentist's office attendants; Express agents; Express messengers; Library assistants and attendants; Mail carriers; Messengers; Office boys; Office machine operators; Physician's office attendants; Railway mail clerks; Receiving clerks; Secretaries; Shipping clerks; Station agents; Stenographers; Telegraph messengers; Telegraph operators; Telephone operators; Ticket agents; Typists.

Sales workers.--Includes Advertising agents and salesmen; Auctioneers; Demonstrators; Hucksters; Insurance agents and brokers; Newsboys; Peddlers; Real estate agents and brokers; Stock and bond salesmen.

Craftsmen, foremen, and kindred workers.--Includes Annealers; Bakers; Blacksmiths; Boiler-makers; Bookbinders; Brickmasons; Cabinetmakers; Carpenters; Cement finishers; Compositors; Concrete finishers; Coppersmiths; Cranemen; Derrickmen; Die makers; Die setters; Electricians; Electrotypers; Engravers; Excavating machinery operators; Forgemen; Glaziers; Goldsmiths; Grading machinery operators; Heat treaters; Hoistmen; Lens grinders and polishers; Lithographers; Locomotive engineers; Locomotive firemen; Log and lumber scalers and graders; Loom fixers; Machinists; Mechanics; Metal

molders; Metal rollers; Metal roll hands; Millers; Millwrights; Motion picture projectionists; Opticians; Organ tuners; Painters (construction and maintenance); Paperhangers; Photoengravers; Piano tuners; Pipe fitters; Plasterers; Plate printers; Plumbers; Power linemen and servicemen; Printing pressmen; Road machinery operators; Roofers; Sheetmetal workers; Shoemakers, except in factories; Silversmiths; Slaters; Stationary engineers; Stereotypers; Stone carvers; Stone cutters; Stonemasons; Structural metal workers; Tailors; Telegraph and telephone linemen and servicemen; Tile setters; Tinsmiths; Tool makers; Typesetters; Upholsterers; Watchmakers; Window dressers.

Operative and kindred workers.--Includes Apprentices; Asbestos workers; Auto service attendants; Blasters; Boatmen; Bus conductors and drivers; Canalmen; Chauffeurs; Deck hands; Deliverymen; Dressmakers; Dry cleaning operatives; Dyers; Fruit, nut, and vegetable graders and packers; Furnacemen; Insulation workers; Laundry operatives; Meat cutters; Metal filers, grinders, and polishers; Metal heaters; Milliners; Mine operatives and laborers; Motormen; Painters (except construction and maintenance); Parking lot attendants; Photographic process workers; Powdermen; Power station operators; Railroad brakemen and switchmen; Routemen; Sailors; Sawyers; Seamstresses; Smeltermen; Stationary firemen; Street railway conductors; Surveying chainmen, rodmen, and axmen; Taxicab drivers; Textile spinners; Textile weavers; Tractor drivers; Truck drivers; Welders.

Private household workers.--Includes housekeepers and laundresses in private households.

Service workers, except private household.--Includes Attendants and ushers in amusement places; Bailiffs; Barbers; Bartenders; Beauticians; Boarding house keepers; Bootblacks; Bridge tenders; Charwomen; Cooks, except in private households; Detectives; Doorkeepers; Elevator operators; Firemen (fire protection); Fountain workers; Guards; Hospital attendants; Janitors; Lodginghouse keepers; Manicurists; Marshals; Midwives; Policemen; Porters; Practical nurses; Sextons; Sheriffs; Stewards; Waiters; Watchmen.

Farm laborers and foremen.--Includes both paid and unpaid family farm laborers, and self-employed farm service laborers.

Laborers, except farm and mine.--Includes Car washers; Fishermen; Garage laborers; Groundskeepers; Longshoremen; Oystermen; Raftsmen; Stevedores; Teamsters; Woodchoppers.

## RELATIONSHIP

Parents were asked in the mail inquiry "What was the relationship of your child to the head of the household in which it was living on May 1, 1950?"<sup>13</sup>

<sup>13</sup> The questionnaire did not define the meaning of the term "household." In census reports, however, a household is defined as all of the persons who occupy a house, apartment, or other group of rooms or a room that constitutes a dwelling unit. Quasi households such as the groups of persons in institutions, hotels, large rooming houses, and military barracks are not counted as households. It is thought that most of the few infants living in quasi households were reported in the mail response as "not related to household head."

## INFANT ENUMERATION STUDY

Table A.--COMPARISON OF CENSUS COUNT OF CHILDREN UNDER 15 YEARS OLD WITH THE NUMBER EXPECTED FROM STATISTICS OF BIRTHS, DEATHS, AND NET MIGRATION, BY AGE, FOR THE UNITED STATES: 1950

(In thousands)

Age	Census count (1)	Expected number on April 1, 1950 <sup>1</sup> (2)	Difference <sup>2</sup> (2) - (1) (3)	Difference as percent of expected number (4)
Under 5 years.....	16,164	16,970	806	4.7
Under 1 year.....	3,147	3,537	390	11.0
Born first 3 months of 1950.....	3818	860	42	4.9
1 and 2 years.....	6,776	7,117	341	4.8
3 and 4 years.....	6,240	6,316	76	1.2
5 to 9 years.....	13,200	13,697	497	3.6
10 to 14 years.....	11,119	11,318	199	1.8

<sup>1</sup> Derived from reported number of births since 1935, adjusted for underregistration, reported deaths adjusted for underregistration in the first year of life, and estimates of net migration.

<sup>2</sup> Represents the net effect of the following errors: (a) Persons missed entirely in the census, (b) persons who should not have been enumerated in the census, (c) persons erroneously reported in another age group, and (d) persons erroneously reported in the age group who should have been reported in another age group.

<sup>3</sup> Data for infants born in first 3 months of 1950 from Infant Card count, supplemented by estimate of the small number of infants enumerated on population schedules but with no Infant Card filled out.

Table B.--1950 BIRTH-REGISTRATION TEST--MATCHED AND UNMATCHED RECORDS FOR ILLEGITIMATE BIRTHS AND INTERSTATE LEGITIMATE AND ILLEGITIMATE BIRTHS, BY COLOR, FOR THE UNITED STATES, BY STATES

(Preliminary data. Birth records for children who died before April 1, 1950, are excluded. Illegitimacy determined through legitimacy question on birth record, or in absence of such entry or item, by lack of information on father)

State of residence	Total				Matched				Unmatched			
	Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>		Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>		Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>	
	White	Non-white	White	Non-white	White	Non-white	White	Non-white	White	Non-white	White	Non-white
United States....	11,964	19,832	18,362	1,212	8,340	14,072	16,339	932	3,624	5,760	2,023	280
Alabama.....	154	1,728	321	43	115	1,299	279	37	39	429	42	6
Arizona.....	23	13	46	13	14	7	41	9	9	6	5	4
Arkansas.....	107	467	279	22	68	319	240	18	39	148	39	4
California.....	315	34	292	12	245	25	252	8	70	9	40	4
Colorado.....	44	3	124	3	31	2	103	2	13	1	21	1
Connecticut.....	118	41	334	5	88	27	289	3	30	14	45	2
Delaware.....	32	96	119	13	24	67	105	11	8	29	14	2
District of Columbia.	86	437	269	20	53	280	233	13	33	157	36	7
Florida.....	197	1,025	239	24	139	749	204	20	58	276	35	4
Georgia.....	162	1,602	371	28	98	1,166	328	26	64	436	43	2
Idaho.....	7	1	187	6	6	1	169	4	1	...	18	2
Illinois.....	687	999	1,059	199	532	732	964	151	155	267	95	48
Indiana.....	354	217	533	13	228	155	498	9	126	62	35	4
Iowa.....	208	16	293	3	182	13	273	2	26	3	20	1
Kansas.....	107	75	652	16	75	50	594	15	32	25	58	1
Kentucky.....	334	232	525	7	221	171	443	6	113	61	82	1

<sup>1</sup> Resident births are those where the birth occurred within a State which was the usual residence of the mother.

<sup>2</sup> Nonresident births are those where the birth occurred in a State which was not the usual residence of the mother.

Source: Federal Security Agency, Public Health Service, National Office of Vital Statistics, Washington 25, D. C.

# INTRODUCTION

Table B.--1950 BIRTH-REGISTRATION TEST--MATCHED AND UNMATCHED RECORDS FOR ILLEGITIMATE BIRTHS AND INTERSTATE LEGITIMATE AND ILLEGITIMATE BIRTHS, BY COLOR, FOR THE UNITED STATES, BY STATES--Con.

(Preliminary data. Birth records for children who died before April 1, 1950, are excluded. Illegitimacy determined through legitimacy question on birth record, or in absence of such entry or item, by lack of information on father)

State of residence	Total				Matched				Unmatched			
	Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>		Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>		Resident illegitimate births <sup>1</sup>		Nonresident legitimate and illegitimate births <sup>2</sup>	
	White	Non-white	White	Non-white	White	Non-white	White	Non-white	White	Non-white	White	Non-white
Louisiana.....	138	1,284	175	31	94	939	155	23	44	345	20	8
Maine.....	165	3	123	...	126	3	92	...	39	...	31	...
Maryland.....	38	42	1,430	189	31	27	1,301	135	7	15	129	54
Massachusetts.....	404	66	308	1	240	43	256	1	164	23	52	...
Michigan.....	642	478	359	10	401	352	321	10	241	126	38	...
Minnesota.....	351	64	479	1	264	48	439	1	87	16	40	...
Mississippi.....	55	1,584	163	16	42	1,160	139	10	13	424	24	6
Missouri.....	310	435	506	81	240	305	433	64	70	130	73	17
Montana.....	39	37	74	1	32	25	62	1	7	12	12	...
Nebraska.....	93	24	229	6	70	15	185	4	23	9	44	2
Nevada.....	4	7	30	1	4	3	23	1	...	4	7	...
New Hampshire.....	48	...	206	...	35	...	180	...	13	...	26	...
New Jersey.....	225	279	992	22	146	150	894	17	79	129	98	5
New Mexico.....	144	28	200	27	89	22	154	19	55	6	46	8
New York.....	1,058	913	454	21	663	573	384	14	395	340	70	7
North Carolina.....	403	1,651	268	56	273	1,163	228	47	130	488	40	9
North Dakota.....	46	20	228	1	36	18	213	1	10	2	15	...
Ohio.....	774	565	743	31	553	404	651	25	221	161	92	6
Oklahoma.....	178	207	357	8	125	164	325	7	53	43	32	1
Oregon.....	131	24	260	1	119	21	235	...	12	3	25	1
Pennsylvania.....	1,042	851	819	22	795	571	734	13	247	280	85	9
Rhode Island.....	77	17	145	2	48	12	125	1	29	5	20	1
South Carolina.....	172	1,275	187	21	93	848	163	13	79	427	24	8
South Dakota.....	39	36	173	14	20	24	159	11	19	12	14	3
Tennessee.....	346	778	478	23	247	579	424	16	99	199	54	7
Texas.....	661	942	432	37	435	677	376	32	226	265	56	5
Utah.....	55	6	41	2	44	5	37	1	11	1	4	1
Vermont.....	57	1	145	...	38	...	134	...	19	1	11	...
Virginia.....	317	977	1,474	130	203	665	1,367	104	114	312	107	26
Washington.....	187	46	223	5	144	37	211	5	43	9	12	...
West Virginia.....	486	149	491	21	334	110	440	18	152	39	51	3
Wisconsin.....	324	51	429	3	220	40	397	3	104	11	32	...
Wyoming.....	20	6	98	1	17	6	87	1	3	...	11	...

<sup>1</sup> Resident births are those where the birth occurred within a State which was the usual residence of the mother.

<sup>2</sup> Nonresident births are those where the birth occurred in a State which was not the usual residence of the mother.

Source: Federal Security Agency, Public Health Service, National Office of Vital Statistics, Washington 25, D. C.

## SUMMARY OF OPERATIONS

The following summary indicates the major steps taken in processing the data for the Infant Enumeration Study.

Collection of basic records.--Enumerators in the 1950 Census filled out a special card, called an Infant Card, for each infant enumerated as born in the first three months of 1950. These special records were sent to the Bureau of the Census where they were promptly separated from the regular population schedules and sent to the National Office of Vital Statistics.

Birth records used in the study were those received by the National Office of Vital Statistics from the State registrars for the production of national vital statistics. These were in the form of microfilm images or hand transcripts of birth certificates for infants registered as born in the first three months of 1950.

About 796,000 usable Infant Cards and about 860,000 birth records were involved. (About 41,000 Infant Cards received were canceled by the Bureau of the Census, generally because they were for infants not born in the period. Also, some birth records were received too late for use.)

Processing at the National Office of Vital Statistics.--The Bureau of the Census furnished trained coders to code occupation. The National Office of Vital Statistics coded all remaining data from both birth records and Infant Cards and prepared one punch card for each birth record and another for each Infant Card.

The two types of punch cards were then matched against each other, following definite rules for the establishment of a match. Most of the matching was done mechanically. Some matches were made in State offices of vital statistics as a result of extensive searches by the State registrars. About 763,000 matches were made, of which 726,000 involved cards for legitimate births occurring in the same State as the mother's usual residence.

Of the unmatched cards based on birth records, about 18,000 were eliminated because the infants died before April 1, 1950, and about 12,000 were eliminated because the infant was registered as illegitimate (or no information was given for the father) or because the infant was born in a State which was not the usual residence of the mother.<sup>14</sup>

Approximately 67,000 unmatched birth records remained. To reduce the cost of the study, a sample of about 31,000 was drawn from these records. (See section on "Reliability of sample data" for an explanation of the nature of the sample.) Lists of infants contained in the sample were then prepared, and information from the birth records was transcribed and sent to the Bureau of the Census.

Processing at the Bureau of the Census.--Letters were sent to most parents of infants listed in the sample of unmatched birth records. (Some unmatched birth records had inadequate addresses or were for Canadian or Mexican addresses. Letters were not sent to these.) A follow-up letter was sent by registered mail when there was no reply to the first letter and when it was not returned by the post office as undeliverable. Letters were also sent in some cases to physicians and to the parents in care of a business; other efforts were also made to trace the parents. Over-all, responses were secured from parents in 73.5 percent of 30,665 original mailing cases. Most of the remaining 26.5 percent consisted of cases where the post office could not locate the parents and there were no further indications of the current address of the parents.

Inspection of the responses disclosed cases where the infant was not living in the United States at the time of the census, cases where the birth date on the record was claimed to be incorrect because the infant was not born during the first three months of 1950, and cases where the infant died before April 1, 1950. About 1,000 cases were eliminated for such reasons.

Remaining cases were used, where feasible, as a basis for the searching of population schedules to determine which infants were missed.

The materials on remaining unmatched infants were then coded and special punch cards for them were prepared.

Tabulation.--The National Office of Vital Statistics prepared tabulations of data for cases that had been matched in that office. The Bureau of the Census prepared tabulations of data for unmatched cases that had been investigated in the mail inquiry.

<sup>14</sup> Cards with no information for the infant's father were regarded as representing illegitimate infants.

## RELIABILITY OF SAMPLE DATA

## SAMPLE DESIGN

The statistics shown in this report are based, in part, on a sample of infants for whom birth records exist. Birth records for which matching Infant Cards could not be found were the only ones subject to sampling. Before sampling, the unmatched birth records were examined and those for infants who were illegitimate or born in a State which was not the mother's usual residence were eliminated, as were birth records that had been matched against records of deaths before April 1, 1950. The remaining unmatched birth records were then stratified within each State; the strata consisted of white and non-white infants in (1) each city of 250,000 inhabitants or more (2) the balance of the State urban and (3) rural (without regard to farm residence). In those strata in which the number of unmatched birth records were small, all unmatched birth records were taken. In the remaining strata, a sample of the unmatched birth records was taken. Table C shows the size of the sample in each region, State, and part thereof, in detail to match table 1.

In interpreting table C, it should be borne in mind that the stratification and selection of the sample were performed on the basis of the addresses as reported on the birth records although tables 1-14 of this report were prepared on the basis of the residence at the time of the 1950 Census insofar as this could be determined, and otherwise on the basis of data from birth records. In addition, the sampling was performed before records were eliminated for children for whom the mail inquiry indicated that the child was living abroad at the time of the census, had died before April 1, 1950, or was not born in the first three months of 1950 despite data given on the birth record. The figures in table C, therefore, do not agree with data for similar groups in table 1. The stratification was effective in producing data of the desired degree of reliability in each State and part of State, however.

Estimates of the number of infants in each category have, in all cases, been obtained by multiplying the data for each infant by the reciprocal of the applicable sampling fraction, and summing the results for all infants in the specific category. Estimates of percentages have been obtained by using values, inflated in this manner, for both numerator and denominator.

## SAMPLING VARIABILITY

The data on "Total birth records" and percentage "Definitely enumerated--Matched with Infant Card" in table 1 and the number of infants shown in tables 1-8 as "Definitely enumerated--Matched with Infant Card" are based on a complete count of Infant Cards and birth records in these categories. Furthermore, some of the other data in table 1 are also based on complete counts when these are shown for parts of States in which all unmatched birth records were followed up. All other statistics are based on a sample and are therefore subject to sampling variability.

Approximate values of the standard error of the statistics in this report are contained in tables D and E. Because of the diversity of sampling rates, exact

estimates of the standard errors would require a separate calculation for each figure based on the sample and a unique expression of its variability. A number of approximations have been made in order to permit the sampling variability to be expressed in the manner shown in tables D and E. These approximations are accurate enough for most uses of the data. It should be noted, however, that they tend to overstate the standard errors for rural and nonwhite estimates and to understate them slightly for estimates relating to urban whites. For more precise determination of the standard errors, methods of deriving better approximations are provided in some of the later paragraphs.

The standard error is a measure of sampling variability. The chances are about 2 out of 3 that the difference due to sampling variability between an estimate and the figure that would have been obtained from a complete count of the population is less than the standard error. The amount by which the standard error must be multiplied to obtain other odds deemed more appropriate can be found in most statistical textbooks. For example, the chances are about 19 out of 20 that the difference is less than twice the standard error, and 99 out of 100 that it is less than 2 1/2 times the standard error.

The standard errors in table D are applicable to the estimates of absolute numbers that are based on sample data.<sup>15</sup> In many States, the data for rural and nonwhites are obtained from complete counts and thus not subject to sampling variability. These States should be identified by reference to table C if the standard errors are being applied to individual State estimates. The standard errors shown in table D depend upon both the size of the estimate and the total number of unmatched birth records in the United States, region, State, or the pertinent parts of these areas. The number of unmatched birth records is shown in table C.

A closer approximation to the standard error of an estimate of an absolute number can be obtained by calculating the value of

$$\sqrt{\frac{x}{N} \left(1 - \frac{x}{N}\right) \sum N_i \left(\frac{1}{f_i} - 1\right)}$$

where  $x$  is the size of the estimate under consideration,  $N$  the total number of unmatched cases in all strata to which the estimate pertains, and the summation is over all pertinent strata with  $N_i$  and  $f_i$  the number of

<sup>15</sup> The stratification by area and color in deriving the sample insures that total birth records for each area-color group are not subject to sampling variability. Sampling variability is present, however, when the total birth records are shown for a subclass of an area-color group, such as farm residence in table 1, age of mother in table 6, etc. Even in these cases, the figures are subject to much smaller variability than for other estimates of the same size because the category "Definitely enumerated--Matched with birth records" is the major component of total birth records and this category is based on a complete count. The standard errors of total birth records for these subclasses are identical with those shown in table D for the total number unmatched in the pertinent categories.

unmatched cases and the sampling fraction, respectively, in each stratum ( $i$ ). The values of  $N_i$  and  $f_i$  are those shown in table C as "Total--Unmatched birth records" and "Percent of unmatched birth records."

The percentages shown in tables 1 through 8 represent, in all cases, ratios of a subclass of birth records to total birth records. The percentage "Definitely enumerated--Matched with Infant Card" is virtually based on a complete count and hence subject to negligible sampling variability. For the remaining percentages, the numerator of the ratio (e.g., the number "Probably enumerated," the number "Probably missed," etc.) is generally based on a sample. The standard error of a percentage in tables 1-8 can be approximated by dividing the denominator of the ratio (i.e., the total number of birth records) into the standard error of the numerator.

The standard errors of the "Adjusted estimate of percent enumerated" are not shown, since no simple general expression for these is available. In any case, the sampling variability of these percentages should not be a cause for concern. Since the largest components of these percentages are based on complete counts, the relative standard errors are quite small and generally are probably negligible even by comparison with the usually small errors arising from the method of estimation of this percentage. For the United States as a whole, the standard error of the adjusted estimate of percent enumerated is 0.03 percent.

Table E contains the standard errors of the percentages shown in tables 9 through 13. As in the case of table D, the standard errors shown are approximations which appear to be accurate enough for most practical uses. More precise estimates can be obtained by calculating the value of

$$\sqrt{\frac{P(1-P)}{Ny} \sum N_i \left( \frac{1}{f_i} - 1 \right)},$$

where  $P$  is the percentage for which the standard error is being estimated,  $N$  is the total number of unmatched cases in all strata involved,  $y$  is the base of the per-

centage, and  $N_i$  and  $f_i$  are the number of unmatched cases and sampling fractions in the pertinent strata ( $i$ ). The summation, as in the previous formula, is over all strata to which the estimate pertains.

**Illustration:** Table 1 shows that there were an estimated 573 infants in California who were definitely missed in the census (1.0 percent of the 54,921 total infants in California). From linear interpolation between values in table D it is found that the standard error of an estimate of 573 is about 45. Consequently, the chances are about 2 out of 3 that the figure which would have been obtained from a complete follow-up of all infants not matched with birth records would have differed by less than 45 from the sample estimate. It also follows that there is only about 1 chance in 100 that a follow-up on a complete basis would have differed by as much as 115, that is, by 2 1/2 times the standard error. The standard error of the estimate of 1.0 percent is obtained by dividing 45 by 54,921, and is 0.1 percent. If a 1.0-percent estimate in tables 9 through 13 was under consideration, the standard error would be obtained from table E; that is, it would be about 0.4 percent if the 1.0 percent had been obtained by dividing an estimate of 25 by 2,500; it would be 0.2 percent if the base were 10,000, etc.

If a closer approximation is desired, the formula given earlier can be used:  $x$  is 573 and  $N$  is 4,281. The summation is over the four parts of the State--urban white, urban nonwhite, rural white, and rural nonwhite, and

$$\sum N_i \left( \frac{1}{f_i} - 1 \right)$$

is equal to 11,540. The standard error obtained by use of the formula is therefore 37.

The standard errors shown in tables D and E are not directly applicable to differences between two estimates. The standard error of a difference between two sample estimates shown in this report is approximately the square root of the sum of the squares of each estimate considered separately.

INTRODUCTION

Table C.--NET SIZE OF SAMPLE OF UNMATCHED BIRTH RECORDS, FOR REGIONS AND STATES, URBAN AND RURAL (WITH COLOR OF INFANT FOR SELECTED AREAS)

(Residence from Infant Cards when these were matched with birth records and from birth records when these were not matched. Color shown for same areas as in table 1)

Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>			Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>		
		Total	In sample				Total	In sample	
			Number	Percent of total unmatched birth records				Number	Percent of total unmatched birth records
UNITED STATES.....	785,767	69,231	26,732	38.6	ALABAMA.....	17,750	1,541	1,050	68.1
White.....	690,584	54,304	18,737	34.5	White.....	11,520	773	414	53.6
Nonwhite.....	95,183	14,927	7,995	53.6	Nonwhite.....	6,230	768	636	82.8
Urban.....	451,491	41,385	11,347	27.4	Urban.....	6,607	514	283	55.1
White.....	398,535	32,772	7,570	23.1	White.....	4,325	253	154	60.9
Nonwhite.....	52,956	8,613	3,777	43.9	Nonwhite.....	2,282	261	129	49.4
Rural.....	334,276	27,846	15,385	55.3	Rural.....	11,143	1,027	767	74.7
White.....	292,049	21,532	11,167	51.9	White.....	7,195	520	260	50.0
Nonwhite.....	42,227	6,314	4,218	66.8	Nonwhite.....	3,948	507	507	100.0
NORTHEAST.....	184,681	18,044	4,148	23.0	ARIZONA.....	4,727	562	347	61.7
White.....	173,105	15,571	3,543	22.8	White.....	4,129	454	261	57.5
Nonwhite.....	11,576	2,473	605	24.5	Nonwhite.....	598	108	86	79.6
Urban.....	135,621	14,420	2,137	14.8	Urban.....	1,772	322	107	33.2
White.....	124,886	12,050	1,614	13.4	Rural.....	2,955	240	240	100.0
Nonwhite.....	10,735	2,370	523	22.1	ARKANSAS.....	9,425	1,055	706	66.9
Rural.....	49,060	3,624	2,011	55.5	White.....	7,204	697	348	49.9
White.....	48,219	3,521	1,929	54.8	Nonwhite.....	2,221	358	358	100.0
Nonwhite.....	841	103	82	79.6	Urban.....	3,266	259	167	64.5
NORTH CENTRAL.....	232,052	15,339	6,182	40.3	White.....	2,523	183	91	49.7
White.....	219,080	13,305	5,090	38.3	Nonwhite.....	743	76	76	100.0
Nonwhite.....	12,972	2,034	1,092	53.7	Rural.....	6,159	796	539	67.7
Urban.....	140,034	10,224	3,070	30.0	White.....	4,681	514	257	50.0
White.....	128,400	8,413	2,129	25.3	Nonwhite.....	1,478	282	282	100.0
Nonwhite.....	11,634	1,811	941	52.0	CALIFORNIA.....	56,458	4,281	1,343	31.4
Rural.....	92,018	5,115	3,112	60.8	White.....	51,601	3,652	945	25.9
White.....	90,680	4,892	2,961	60.5	Nonwhite.....	4,857	629	398	63.3
Nonwhite.....	1,338	223	151	67.7	Urban.....	36,986	2,902	863	29.7
SOUTH.....	260,004	28,033	12,674	45.2	White.....	33,271	2,393	525	21.9
White.....	196,283	18,570	7,024	37.8	Nonwhite.....	3,715	509	338	66.4
Nonwhite.....	63,721	9,463	5,650	59.7	Rural.....	19,472	1,379	480	34.8
Urban.....	112,292	11,726	4,313	36.8	White.....	18,330	1,259	420	33.4
White.....	86,298	7,951	2,408	30.3	Nonwhite.....	1,142	120	60	50.0
Nonwhite.....	25,994	3,775	1,905	50.5	COLORADO.....	7,652	542	306	56.5
Rural.....	147,712	16,307	8,361	51.3	Urban.....	4,390	396	160	40.4
White.....	109,985	10,619	4,616	43.5	Rural.....	3,262	146	146	100.0
Nonwhite.....	37,727	5,688	3,745	65.8	CONNECTICUT.....	9,288	808	359	44.4
WEST.....	109,030	7,815	3,728	47.7	Urban.....	6,141	561	112	20.0
White.....	102,116	6,858	3,080	44.9	Rural.....	3,147	247	247	100.0
Nonwhite.....	6,914	957	648	67.7	DELAWARE.....	1,541	170	170	100.0
Urban.....	63,544	5,015	1,827	36.4	Urban.....	665	76	76	100.0
White.....	58,951	4,358	1,419	32.7	Rural.....	876	94	94	100.0
Nonwhite.....	4,593	657	408	62.1	DIST. OF COLUMBIA..	3,634	480	159	33.1
Rural.....	45,486	2,800	1,901	67.9	White.....	2,133	230	76	33.0
White.....	43,165	2,500	1,661	66.4	Nonwhite.....	1,501	250	83	33.2
Nonwhite.....	2,321	300	240	80.0					

<sup>1</sup> Records at hand at time census sample of unmatched birth records was drawn. Additional records (late matches) were used in other tables.

<sup>2</sup> Excludes records matched after selection of sample. Includes records later eliminated when responses from mail, inquiry indicated child was living abroad at time of census, had died before April 1, 1950, or was not born in the first three months of 1950 despite date given on birth record.

## INFANT ENUMERATION STUDY

Table C.--NET SIZE OF SAMPLE OF UNMATCHED BIRTH RECORDS, FOR REGIONS AND STATES, URBAN AND RURAL  
(WITH COLOR OF INFANT FOR SELECTED AREAS)--Con.

(Residence from Infant Cards when these were matched with birth records and from birth records when these were not matched. Color shown for same areas as in table 1)

Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>			Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>		
		Total	In sample				Total	In sample	
			Number	Percent of total unmatched birth records				Number	Percent of total unmatched birth records
FLORIDA.....	13,573	1,500	949	63.3	KENTUCKY.....	17,053	1,977	607	30.7
White.....	10,310	990	612	61.8	White.....	16,019	1,808	492	27.2
Nonwhite.....	3,263	510	337	66.1	Nonwhite.....	1,034	169	115	68.0
Urban.....	7,021	858	307	35.8	Urban.....	5,516	598	263	44.0
White.....	5,169	546	168	30.8	White.....	4,876	500	165	33.0
Nonwhite.....	1,852	312	139	44.6	Nonwhite.....	640	98	98	100.0
Rural.....	6,552	642	642	100.0	Rural.....	11,537	1,379	344	24.9
White.....	5,141	444	444	100.0					
Nonwhite.....	1,411	198	198	100.0	LOUISIANA.....	15,713	1,710	854	49.9
GEORGIA.....	19,513	1,986	858	43.2	White.....	9,880	840	419	49.9
White.....	12,913	1,109	464	41.8	Nonwhite.....	5,833	870	435	50.0
Nonwhite.....	6,600	877	394	44.9	Urban.....	7,889	859	429	49.9
Urban.....	7,751	848	290	34.2	White.....	5,164	439	219	49.9
White.....	5,111	480	150	31.3	Nonwhite.....	2,725	420	210	50.0
Nonwhite.....	2,640	368	140	38.0	Rural.....	7,824	851	425	49.9
Rural.....	11,762	1,138	568	49.9	White.....	4,716	401	200	49.9
White.....	7,802	629	314	49.9	Nonwhite.....	3,108	450	225	50.0
Nonwhite.....	3,960	509	254	49.9	MAINE.....	4,700	394	285	72.3
IDAHO.....	3,693	176	127	72.2	Urban.....	2,092	217	108	49.8
White.....	1,649	95	46	48.4	Rural.....	2,608	177	177	100.0
Nonwhite.....	2,044	81	81	100.0	MARYLAND.....	10,884	1,226	752	61.3
ILLINOIS.....	41,323	3,317	653	19.7	White.....	8,409	738	439	59.5
White.....	37,900	2,700	473	17.5	Nonwhite.....	2,475	488	313	64.1
Nonwhite.....	3,423	617	180	29.2	Urban.....	6,214	772	298	38.6
Urban.....	30,537	2,665	328	12.3	White.....	4,470	435	136	31.3
White.....	27,237	2,061	154	7.5	Nonwhite.....	1,744	337	162	48.1
Nonwhite.....	3,300	604	174	28.8	Rural.....	4,670	454	454	100.0
Rural.....	10,786	652	325	49.8	White.....	3,939	303	303	100.0
INDIANA.....	20,949	1,465	566	38.6	Nonwhite.....	731	151	151	100.0
White.....	19,953	1,309	489	37.4	MASSACHUSETTS.....	22,394	2,066	605	29.3
Nonwhite.....	996	156	77	49.4	Urban.....	18,869	1,815	354	19.5
Urban.....	11,856	865	267	30.9	Rural.....	3,525	251	251	100.0
White.....	10,898	716	193	27.0	MICHIGAN.....	35,848	2,311	806	34.9
Nonwhite.....	958	149	74	49.7	White.....	33,063	1,928	560	29.0
Rural.....	9,093	600	299	49.8	Nonwhite.....	2,785	383	246	64.2
IOWA.....	13,977	559	331	59.2	Urban.....	22,582	1,542	422	27.4
White.....	6,444	303	75	24.8	White.....	20,003	1,184	188	15.9
Nonwhite.....	7,533	256	256	100.0	Nonwhite.....	2,579	358	234	65.4
KANSAS.....	9,250	706	401	56.8	Rural.....	13,266	769	384	49.9
White.....	4,798	405	100	24.7	MINNESOTA.....	16,899	662	534	80.7
Nonwhite.....	4,452	301	301	100.0	Urban.....	9,115	403	275	68.2
					Rural.....	7,784	259	259	100.0

<sup>1</sup> Records at hand at time census sample of unmatched birth records was drawn. Additional records (late matches) were used in other tables.

<sup>2</sup> Excludes records matched after selection of sample. Includes records later eliminated when responses from mail, inquiry indicated child was living abroad at time of census, had died before April 1, 1950, or was not born in the first three months of 1950 despite date given on birth record.

INTRODUCTION

Table C.--NET SIZE OF SAMPLE OF UNMATCHED BIRTH RECORDS, FOR REGIONS AND STATES, URBAN AND RURAL (WITH COLOR OF INFANT FOR SELECTED AREAS)--Con.

(Residence from Infant Cards when these were matched with birth records and from birth records when these were not matched. Color shown for same areas as in table 1)

Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>			Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>		
		Total	In sample				Total	Number	Percent of total unmatched birth records
			Number	Percent of total unmatched birth records					
MISSISSIPPI.....	14,153	1,580	948	60.0	NORTH CAROLINA.....	23,260	2,341	873	37.3
White.....	6,374	512	447	87.3	White.....	16,244	1,346	415	30.8
Nonwhite.....	7,779	1,068	501	46.9	Nonwhite.....	7,016	995	458	46.0
Urban.....	3,629	328	131	39.9	Urban.....	6,539	644	181	28.1
White.....	2,043	130	65	50.0	White.....	4,755	397	99	24.9
Nonwhite.....	1,586	198	66	33.3	Nonwhite.....	1,784	247	82	33.2
Rural.....	10,524	1,252	817	65.3	Rural.....	16,721	1,697	692	40.8
White.....	4,331	382	382	100.0	White.....	11,489	949	316	33.3
Nonwhite.....	6,193	870	435	50.0	Nonwhite.....	5,232	748	376	50.3
MISSOURI.....	18,957	1,848	749	40.5	NORTH DAKOTA.....	3,485	179	179	100.0
White.....	17,478	1,589	548	34.5	Urban.....	1,013	50	50	100.0
Nonwhite.....	1,479	259	201	77.6	Rural.....	2,472	129	129	100.0
Urban.....	11,226	1,101	376	34.2	OHIO.....	41,567	2,881	976	33.9
White.....	9,970	905	206	22.8	White.....	38,679	2,471	714	28.9
Nonwhite.....	1,256	196	170	86.7	Nonwhite.....	2,888	410	262	63.9
Rural.....	7,731	747	373	49.9	Urban.....	27,486	2,129	840	39.5
MONTANA.....	3,609	216	150	69.4	White.....	24,829	1,751	594	33.9
Urban.....	1,598	130	64	49.2	Nonwhite.....	2,657	378	246	65.1
Rural.....	2,011	86	86	100.0	Rural.....	14,081	752	136	18.1
NEBRASKA.....	7,076	464	290	62.5	OKLAHOMA.....	11,032	869	431	49.6
Urban.....	3,429	259	85	32.8	White.....	9,860	700	262	37.4
Rural.....	3,647	205	205	100.0	Nonwhite.....	1,172	169	169	100.0
NEVADA.....	719	57	57	100.0	Urban.....	6,006	420	159	37.9
Urban.....	400	40	40	100.0	White.....	5,447	347	86	24.8
Rural.....	319	17	17	100.0	Nonwhite.....	559	73	73	100.0
NEW HAMPSHIRE.....	2,497	192	136	70.8	Rural.....	5,026	449	272	60.6
Urban.....	1,471	112	56	50.0	OREGON.....	8,025	396	333	84.1
Rural.....	1,026	80	80	100.0	Urban.....	3,679	205	142	69.3
NEW JERSEY.....	21,577	2,072	609	29.4	Rural.....	4,346	191	191	100.0
White.....	19,637	1,727	384	22.2	PENNSYLVANIA.....	49,957	4,531	854	18.8
Nonwhite.....	1,940	345	225	65.2	White.....	46,743	3,890	681	17.5
Urban.....	17,187	1,684	442	26.2	Nonwhite.....	3,214	641	173	27.0
White.....	15,538	1,374	264	19.2	Urban.....	31,990	3,300	445	13.5
Nonwhite.....	1,649	310	178	57.4	White.....	29,032	2,676	277	10.4
Rural.....	4,390	388	167	43.0	Nonwhite.....	2,958	624	168	26.9
NEW MEXICO.....	4,659	655	407	62.1	Rural.....	17,967	1,231	409	33.2
Urban.....	2,297	329	81	24.6	RHODE ISLAND.....	3,699	297	188	63.3
Rural.....	2,362	326	326	100.0	Urban.....	3,161	251	142	56.6
NEW YORK.....	68,685	7,567	995	13.1	Rural.....	538	46	46	100.0
White.....	63,188	6,257	852	13.6					
Nonwhite.....	5,497	1,310	143	10.9					
Urban.....	53,846	6,426	424	6.6					
White.....	48,573	5,158	302	5.9					
Nonwhite.....	5,273	1,268	122	9.6					
Rural.....	14,839	1,141	571	50.0					

<sup>1</sup> Records at hand at time census sample of unmatched birth records was drawn. Additional records (late matches) were used in other tables.

<sup>2</sup> Excludes records matched after selection of sample. Includes records later eliminated when responses from mail, inquiry indicated child was living abroad at time of census, had died before April 1, 1950, or was not born in the first three months of 1950 despite date given on birth record.

## INFANT ENUMERATION STUDY

Table C.--NET SIZE OF SAMPLE OF UNMATCHED BIRTH RECORDS, FOR REGIONS AND STATES, URBAN AND RURAL  
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Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>			Area and color	Total birth records <sup>1</sup>	Unmatched birth records <sup>2</sup>		
		Total	In sample				Total	In sample	
			Number	Percent of total unmatched birth records				Number	Percent of total unmatched birth records
SOUTH CAROLINA.....	12,400	1,647	823	50.0	UTAH.....	4,909	216	142	65.7
White.....	6,985	674	337	50.0	Urban.....	2,953	148	74	50.0
Nonwhite.....	5,415	973	486	49.9	Rural.....	1,956	68	68	100.0
Urban.....	3,590	392	196	50.0	VERMONT.....	1,884	117	117	100.0
White.....	2,329	210	105	50.0	Urban.....	864	54	54	100.0
Nonwhite.....	1,261	182	91	50.0	Rural.....	1,020	63	63	100.0
Rural.....	8,810	1,255	627	50.0	VIRGINIA.....	16,661	1,664	662	39.8
White.....	4,656	464	232	50.0	White.....	12,726	1,039	345	33.2
Nonwhite.....	4,154	791	395	49.9	Nonwhite.....	3,935	625	317	50.7
SOUTH DAKOTA.....	3,948	187	187	100.0	Urban.....	6,048	499	199	39.9
Urban.....	1,501	69	69	100.0	White.....	4,598	296	98	33.1
Rural.....	2,447	118	118	100.0	Nonwhite.....	1,450	203	101	49.8
TENNESSEE.....	17,925	1,757	961	54.7	Rural.....	10,613	1,165	463	39.7
White.....	14,872	1,374	627	45.6	White.....	8,128	743	247	33.2
Nonwhite.....	3,053	383	334	87.2	Nonwhite.....	2,485	422	216	51.2
Urban.....	6,776	638	305	47.8	WASHINGTON.....	13,040	634	436	68.8
White.....	4,994	445	161	36.2	Urban.....	6,945	394	196	49.7
Nonwhite.....	1,782	193	144	74.6	Rural.....	6,095	240	240	100.0
Rural.....	11,149	1,119	656	58.6	WEST VIRGINIA.....	11,057	1,129	430	38.1
White.....	9,878	9,929	466	50.2	White.....	10,478	1,047	348	33.2
Nonwhite.....	1,271	190	190	100.0	Nonwhite.....	579	82	82	100.0
TEXAS.....	44,430	5,401	1,441	26.7	Urban.....	3,082	311	118	37.9
White.....	39,027	4,566	852	18.7	Rural.....	7,975	818	312	38.1
Nonwhite.....	5,403	835	589	70.5	WISCONSIN.....	18,773	760	510	67.1
Urban.....	28,059	3,230	752	23.3	Urban.....	10,047	433	183	42.3
White.....	24,864	2,714	482	17.8	Rural.....	8,726	327	327	100.0
Nonwhite.....	3,195	516	270	52.3	WYOMING.....	1,539	80	80	100.0
Rural.....	16,371	2,171	689	31.7	Urban.....	875	54	54	100.0
White.....	14,163	1,852	370	20.0	Rural.....	664	26	26	100.0
Nonwhite.....	2,208	319	319	100.0					

<sup>1</sup> Records at hand at time census sample of unmatched birth records was drawn. Additional records (late matches) were used in other tables.

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Table D.--STANDARD ERROR OF ESTIMATED NUMBER

(Range of 2 chances out of 3. Not applicable to figures shown for "Definitely enumerated--Matched with infant card" which are not based on a sample, or to total birth records)

Estimated number	Number of unmatched birth records <sup>1</sup>							
	100	250	500	1,000	5,000	10,000	25,000	70,000
10.....	5	5	5	5	5	5	5	5
25.....	10	10	10	10	10	10	10	10
50.....	10	15	15	15	15	15	15	15
100.....	...	15	20	20	20	20	20	20
250.....	...	...	20	25	30	30	30	30
500.....	...	...	...	30	40	45	45	45
1,000.....	...	...	...	...	55	60	60	65
2,500.....	...	...	...	...	70	85	95	100
5,000.....	...	...	...	...	...	100	125	135
10,000.....	...	...	...	...	...	...	155	185
25,000.....	...	...	...	...	...	...	...	255
50,000.....	...	...	...	...	...	...	...	240

<sup>1</sup> See table C for the number of unmatched birth records. For rural-farm or rural-nonfarm estimates, the total rural unmatched birth records should be used. For nonwhite statistics, the number of nonwhite total, urban, or rural unmatched birth records is to be used, whichever is applicable.

Table E.--STANDARD ERROR OF ESTIMATED PERCENTAGES IN TABLES 9-13

(Range of 2 chances out of 3)

Estimated percentage	Size of base						
	250	500	1,000	2,500	5,000	10,000	16,000
1 or 99.....	1.3	0.9	0.6	0.4	0.3	0.2	0.2
2 or 98.....	1.8	1.3	0.9	0.6	0.4	0.3	0.2
5 or 95.....	2.8	1.9	1.4	0.9	0.6	0.4	0.3
10 or 90.....	3.8	2.7	1.9	1.2	0.8	0.6	0.5
25 or 75.....	5.5	3.9	2.7	1.7	1.2	0.9	0.7
50.....	6.3	4.5	3.2	2.0	1.4	1.0	0.8